

Report of Field Activities: St. Lawrence Island 2019

Acknowledgements and Participants:

This research could not have been done without the support and expert knowledge of the community of Savoonga. We would like to thank both the Native Village of Savoonga and Kukulget Incorporated for their permission to work in their community and on their island. Thank you to Flashman Noongwook, and Cerene Seppilu for help with local logistics. We would also like to thank Tawny Alowa and her family for their hospitality and providing us lodging and storing our gear. Thank you to Ronnie Toolie for always being ready and willing to work on our Hondas. Thank you to the Akeya, Pelowook, and James families for the use of your camps. We would also like to thank Kristen Woodie, Gaetano Brancaleone III, and Melissa Schuyler-Carlson for assistance with organizing classroom visits, and Liliana Naves for guidance during our harvest survey. We would like to specifically acknowledge the hard work of Michael Toolie and Punguk Shoogukwruk who have served as our primary guides and who basically made all this research possible. Thank you to all of our guides for your assistance and sharing your stories and culture with us. Project personnel, for all years (alphabetically) include:

David Akeya, *Savoonga*

Morgan Annogiyuk, *Savoonga*

Hillary Burgess, *COASST*

Carl Burnside, *University of Alaska Fairbanks*

Jen Curl, *Alaska Department of Fish and Game*

Larisa Kava, *Savoonga*

Lucy Kingeekuk, *Savoonga*

Mylon Kingeekuk, *Savoonga*

Michael Kiyuklook, *Savoonga*

Alexander Kitaysky, *University of Alaska Fairbanks*

Wendi Pillars, *Jordan-Matthews High School Siler City, North Carolina*

Punguk Shoogukwruk, *Savoonga*

Akinori Takahashi, *National Institute of Polar Research, Tokyo, Japan*

Jean-Baptiste Thiebot, *National Institute of Polar Research, Tokyo, Japan*

Michael Toolie, *Savoonga*

Ronnie Toolie, *Savoonga*

Shota Tsukamoto, *Hokkaido University, Hakodate, Japan*

Aqef Waghiyi, *Savoonga*

Alexis Will, *National Institute of Polar Research / University of Alaska Fairbanks*

Project Overview

Since 2016 we have been investigating the responses of 5 seabird species breeding near Savoonga, Alaska (St. Lawrence Island) to changes in their environment, specifically in response to declining sea ice. Our primary objectives are to obtain tracks of seabird winter migration and to characterize the physiological response and general diet composition of seabirds at two different times of the year, during the summer and late winter. For more information regarding this project or the content of this report please contact Alexis Will: awill4@alaska.edu or 907-752-5005. Primary funders: Japan's Arctic Challenge for Sustainability Project, the Japanese Society for the Promotion of Science, and the North Pacific Research Board. Additional support provided by the Arctic Research Consortium of the U.S. (ARCUS), and National Parks Service.

Study Species

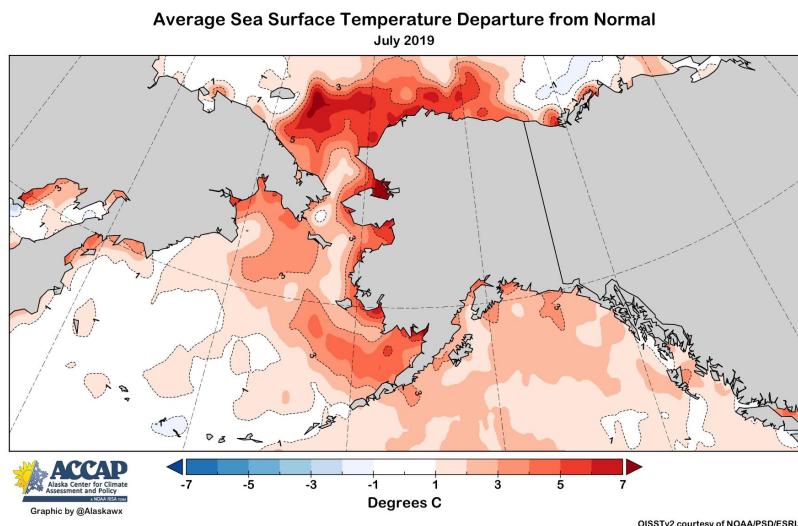
| Abbreviation | English Name | SLI Yupik Name |
|--------------|------------------------|---------------------|
| TBMU | Thick-billed Murre | <i>Alpa</i> |
| COMU | Common Murre | |
| BLKI | Black-legged Kittiwake | <i>Qaqsungiq</i> |
| LEAU | Least Auklet | <i>Akmaaliighak</i> |
| CRAU | Crested Auklet | <i>Sukilpaq</i> |

Season Summary

This summer we conducted work in two installments, first visiting the island in late June to catch previously tagged murres and kittiwakes at the start of the breeding season, then again during our usual mid-July to late August time frame which coincides with the chick-rearing period for all five of our study species. This summer, waters in the Northern Bering Sea and Bering Strait were 1-7 degrees C above normal, and corresponded to a jellyfish bloom of a large, complex species capable of consuming large quantities of zooplankton and larval fish.

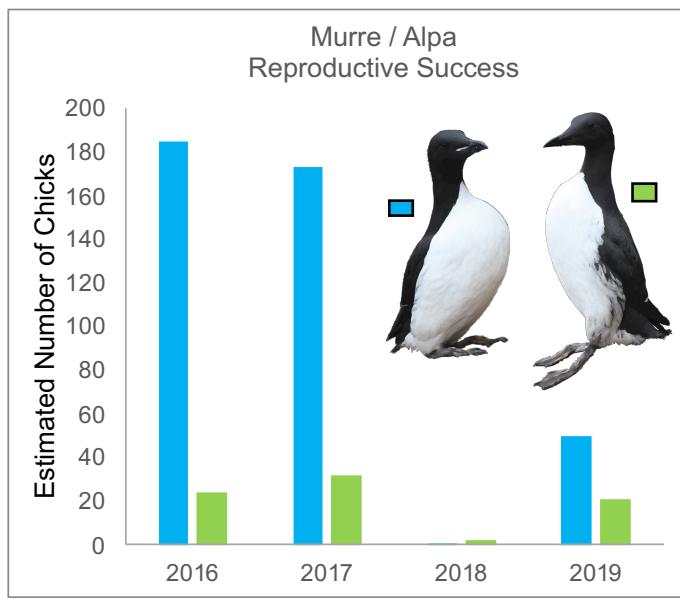
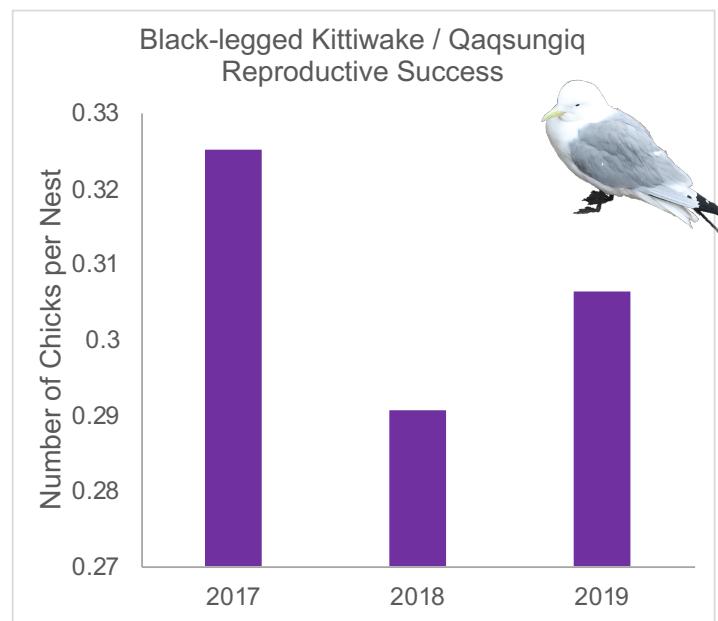
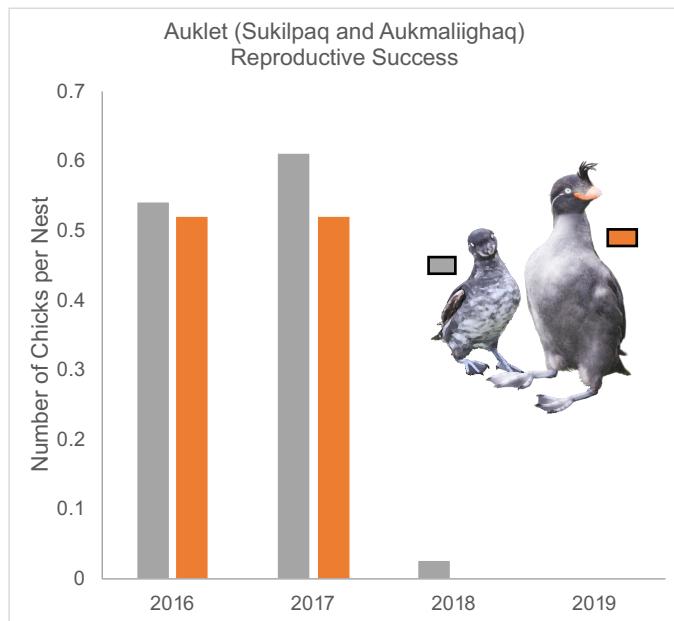
The anomalously warm waters really began to affect auklets in the end of July. Least auklets were the first to fail. In the last week of July adults began to abandon their nests just as chicks were hatching. We observed no copepods in the limited number of diet samples we were able to collect. Crested auklets did not fully abandon the colony until mid-August. Perhaps because they can fly further and dive deeper they were able to continue to find small patches of food that kept some of the colony going through the first couple weeks of chick rearing. Both auklet species hatched chicks about one week earlier than in previous years.

Black-legged kittiwakes appeared to be unaffected by the warmer water conditions, as did common murres. Gull predation on black-legged chicks and murre eggs at our study plots was higher than normal, however this does not seem to have greatly affected the productivity estimates. We observed fewer thick-billed murres attending the cliffs this year compared to in 2017, a possible result of the large number of murres that died last year. In August 2019 we saw a few shearwaters washing up on beaches, likely part of a larger die-off reported in the region. We also observed crested auklets starving near shore, and began to find crested auklets washing up during our August beach survey. We heard that beaches towards Northeast Cape were covered in dead crested auklets.



Reproductive Success/Failure

Both crested and least auklets experienced complete reproductive failure. Black-legged kittiwakes and common murres produced similar numbers of chicks compared to previous years. Thick-billed murres produced fewer chicks, but we are not sure yet how much of this may be due to fewer birds returning to the colony after the large die-off of thick-billed murres last summer.



There were one quarter fewer thick-billed murres breeding in 2019 than in 2017. Counts during peak attendance were 25% lower in 2019 compared to 2017.

Logger Recovery

We had some success retrieving loggers deployed in past years. Of those retrieved in 2019 all but 2 of the common murre and 2 of the thick-billed murre tags were originally deployed in 2017. These 4 murre tags were deployed in 2016. We also deployed 4 GPS tags on incubating murres (2 on common and 2 on thick-billed) and collected foraging tracks from all 4 individuals.

| Geolocator Tags | | | | | | | |
|-----------------|---------------|----------------|---------------|----------------|----------------|---------------------------|--|
| | Deployed 2016 | Retrieved 2017 | Deployed 2017 | Retrieved 2018 | Retrieved 2019 | Original Project At Large | Deployed 2019 (Avian Influeza Project) |
| TBMU | 20 | 2 | 28 | 0 | 3 | 43 | 15 |
| COMU | 15 | 1 | 16 | 0 | 2 | 28 | 7 |
| BLKI | 11 | 5 | 26 | 2 | 7 | 23 | 0 |
| LEAU | 25 | 5 | 46 | 5 | 0 | 61 | 0 |
| CRAU | 15 | 2 | 47 | 10 | 3 | 47 | 18 |

Physiological Sample Inventory

Despite poor breeding success for several of our study species we were still able to collect adequate sample sizes for our physiological work.

| | Total Sampled | Had sampled once before |
|------|---------------|-------------------------|
| TBMU | 24 | 3 |
| COMU | 18 | 2 |
| BLKI | 15 | 7 |
| LEAU | 38 | 4 |
| CRAU | 79 | 19 |

Murre Monitoring Project

We set-up our cameras at Kiveepuk in late June this year, and, as of the writing of this report, they are still collecting data (they'll be taken down in the end of August). They take a picture of the cliff every hour, and using freely available photo analysis software we can track the fate of murre nests. This year we'll be returning in January or February to work with the high school science classes to analyze the photos to determine more accurately the reproductive success of common and thick-billed murres. We are hoping to continue to slowly expand this project and turn it over to the community of Savoonga in the next couple of years. At the top of the next page is an example of one of the pictures from these cameras, inset is a picture of the camera set up at the cliffs. Sporadic updates for this project can be found at:

<https://www.arcus.org/tac/projects/savoonga-monitoring>



Plans for the Future

This summer we received one year of funding (for field work in 2020) from the National Institute of Health's American Indian/Alaska Native Clinical and Translational Research Program to follow-up on the possible role avian influenza may have played in the die-off of thick-billed murres last summer. This award was possible only because of the support we've received from the Council. As part of this work we collected samples from both murre species and crested auklets to be screened for avian influenza (26 crested auklets, and all of the murres we handled). We hope to have these samples analyzed by early winter. We plan to work with hunters during the spring murre bird harvest to collect additional murre samples. We have funds to analyze 190 birds total. The goal is to again (the last screening occurred in ~2006) assess whether murres pose a risk of exposure to avian influenza.

Outreach

This year we attempted to do a summer outreach event, including field trips to the auklet colony and cliffs, and an audio workshop. This event was mostly a learning experience for us. We had success with our community connection event of making t-shirts, and attracted a few people to our s'mores and bonfire at Ivgak. Communicating that the events were happening and what they consisted of seemed to be the biggest challenges.



The 2019 season was characterized by unusually warm water and a bloom of very large jellyfish. (photo by: JB Thiebot).